

and so truly scientific. In spite of his modesty, his great natural abilities made him famous in Geneva, in Switzerland, and abroad. His death leaves a gap difficult to fill.

R. GAUTIER.

PROF. THEODOR BREDICHIN.

FOR the past ten years Prof. Bredichin lived in well-earned and dignified retirement in Saint Petersburg. After a life spent in directing, with consummate ability, the activities of the two great astronomical observatories of Moscow and Pulkova, he sought, while his energies were still vigorous, opportunity for cultivating with greater leisure those studies to which he had conspicuously devoted himself while in a public position. In the midst of that self-imposed work and at the zenith of his reputation, he has been removed by death to the profound loss of science in Russia. In 1857, he was called to fill the chair of astronomy in the University of Moscow, and with it to undertake the direction of the observatory. There he remained for thirty-three years, and devoted himself to astrospectroscopic observation, a subject new in Russia, to the study of variable stars, to gravity determinations by means of pendulum observations, and to a host of inquiries with which his name has long been connected. But most of all was his attention concentrated upon the formation and behaviour of comet tails, a subject which had practically lain dormant since Bessel's researches on the comet of Halley. Of this subject he never wearied, and shortly before his death he collected and published his more important papers bearing on this inquiry. This revision was perhaps the more necessary since photographs had revealed minuter details than could easily be detected in the ordinary telescope. It must be a matter of gratification to his numerous friends that the distinguished astronomer, in spite of bad health, was able to complete a task which had occupied him for so many years.

In 1890, when Prof. Otto Struve retired from the direction of the Pulkova Observatory, Dr. Bredichin took charge of that institution, but his health did not permit him to remain long at this post, and in 1894, accompanied by the regrets of the staff, he resigned his position at the observatory, but not before he had given a decided impetus to the progress of celestial photography. We have already intimated how, in the remaining years of his life, he sought to promote the interests of his favourite science.

Some 150 papers on a variety of subjects were published by Dr. Bredichin, and by the foundation of prizes for special astronomical inquiries he still further encouraged the science. As a teacher he enjoyed the reputation of being able to inspire his pupils with a lifelong interest in astronomy, and the present position of the science in Russia owes not a little to the enthusiasm which he imparted to his pupils. At the age of 73, but with his faculties acute and with his interest in astronomy unimpaired, Russia has to regret the loss of one of her most brilliant sons, while science is deprived of an ardent and enthusiastic supporter.

ROYAL COLLEGE OF SCIENCE, 1903.

SCIENCE scholars selected from the whole of Great Britain for their ability and promise, maintaining themselves on 17s. 9d. a week, were this year saved from much privation by secret gifts of small bursaries—see the subjoined audited account. Prof. Perry says he has no right to ask for help from the

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generous men who helped him last year, but he has all the sturdiness of a chartered beggar—he asks in a good cause.

ROYAL COLLEGE OF SCIENCE.

BALANCE SHEET.

BURSARIES 1903-1904.

Moneys Received and Paid by Prof. Perry, November, 1903, and June, 1904.

RECEIVED	PAID
Balance in hand from last year ... £31 5 0	Nov. 16 to April 25. 27 students received half-bursaries ... £135 0 0
September, 1903.	March 23.
R. K. Gray, Esq. ... 10 0 0	1 student received the second half ... 5 0 0
B. Hopkinson, Esq. ... 10 0 0	June 10 to June 14. 23 students received the second halves of their bursaries... 115 0 0
Sir A. Noble, K.C.B. ... 10 0 0	Balance in hand ... 24 2 0
October 8, 1903.	
W. F. Stanley, Esq. ... 10 0 0	
The Drapers' Co. ... 100 0 0	
The Goldsmiths' Co. ... 100 0 0	
(Royalties.)	
Prof. Perry ... 5 7 0	
Paid back ... 2 10 0	
£279 2 0	£279 2 0

Twenty-seven students received 5l. each; only twenty-four of them applied for the second halves of their bursaries.

Audited and Signed by JOHN W. JUDD.

Dated June 23, 1904.

NOTES.

AN important deputation organised by the British Association will be received by Mr. Balfour to-morrow (Friday) afternoon, and will support the plea for the State endowment of higher education and research presented by Sir Norman Lockyer in his presidential address last year. Oxford and Cambridge will be represented by their Vice-Chancellors and others, London University by Lord Rosebery (Chancellor) and others, and the Birmingham University representatives will be headed by Mr. Chamberlain (Chancellor), who it is hoped will speak for all the new universities. According to a statement prepared by the president of the British Association and revised by a committee consisting of the Deputy Vice-Chancellor of Oxford, the Vice-Chancellor of Cambridge, Sir Oliver Lodge, principal of Birmingham University, Sir Michael Foster, M.P., and Sir Henry Roscoe, the British Association has taken action regarding the State endowment of universities, because at the present juncture the highest education and research is a matter not merely of academic, but of the gravest national concern.

PROF. G. GAFFKY, professor of hygiene in the University of Giessen, has accepted Prof. Koch's vacant chair in the University of Berlin.

THE following appointments are announced in connection with the Institut Marey:—Prof. A. Chauveau has been elected president and director; Prof. H. Kronecker becomes vice-President; Prof. M. Levy, treasurer; and Prof. G. Weiss, secretary.

THE sixth centenary of the birth of Francesco Petrarca will be celebrated at Arezzo from July 20 to 25. Among the festivities will be an historic *fête* in the amphitheatre of the Prato in fourteenth century costume, commemorating the arrival of Petrarca at Arezzo in 1350.

THE Mackinnon studentships of the Royal Society have been filled for the ensuing year by the election of Mr. Bryan Cookson for research in astronomy, and particularly for a new determination of the constant of aberration and

for an investigation of the mass and compression of Jupiter and of corrections to the elements of the orbits of his satellites; and to Mr. L. Doncaster for research on the early development of the egg, &c., in various species of sawflies, and for breeding experiments with certain species of Lepidoptera and with domestic animals.

A COMMITTEE has been formed in the Victoria University of Manchester to procure a portrait of Prof. Osborne Reynolds, F.R.S., the senior member of the teaching staff, as a memorial of the long and distinguished services which he has rendered to the Owens College and of his many valuable original contributions to physical science and engineering. In view of the eminent and widely recognised position which Prof. Reynolds holds as a scientific investigator, it is felt that there are many friends not immediately connected with the university who would be glad to be associated with the memorial. Any subscriptions should be sent to the treasurer of the Manchester Committee (Mr. S. Chaffers, Owens College).

SIR OLIVER LODGE, and other representatives of leading educational institutions in Birmingham, have addressed a memorial to the Lord Mayor of the city suggesting the establishment of a natural history museum on a portion of land recently acquired by the corporation. The memorial states:—"The absence of such a museum is, in our opinion, a grave defect in our municipal institutions, and is a matter of astonishment to strangers visiting our city. Several valuable collections of objects of natural history have already been lost to the city for want of a suitable building in which to deposit them, and many more collections—zoological, entomological, botanical, and geological—will find their way to metropolitan and other museums if suitable provision is not made in Birmingham for their reception."

It is proposed to hold an optical convention in London next year. At a meeting held on Monday, in the rooms of the Society of Arts, Dr. R. T. Glazebrook, F.R.S., the president of the Optical Society, occupying the chair, an executive committee was elected, and the following were elected honorary vice-presidents:—Lord Crawford, Lord Rosse, Lord Rayleigh, Lord Blythwood, Sir William Abney, the Hon. Alban Gibbs, Mr. W. H. M. Christie (the Astronomer Royal), Mr. T. R. Dallmeyer, Mr. J. Stuart, Sir Howard Grubb, Dr. Glazebrook, and Lord Kelvin. One of the honorary vice-presidents will be asked to take the position of president of the convention.

THE report of the committee on ancient earthworks and fortified enclosures was presented to the congress of archaeological societies on July 6. The committee expresses regret that more archaeological societies have not taken up the idea of compiling a schedule of the ancient defensive works in their respective districts; and it is urged upon the secretaries of societies to arrange, when possible, for the survey and scheduling of all such works as are included in the inquiry. The committee concludes the report by again impressing upon archaeologists the importance of doing their utmost to prevent the destruction which from time to time threatens so many defensive enclosures of earth or stone.

THE seventy-second annual meeting of the British Medical Association will be held at Oxford from July 26–29. The president is Dr. T. D. Griffiths, and the president-elect Dr. W. Collier. An address in medicine will be delivered by Sir William S. Church, Bart., K.C.B., and an address in surgery will be delivered by Sir William Macewen. A popular lecture will be delivered by Dr. G. Bagot Ferguson

on Thursday evening, July 28. The annual meeting this year will comprise fourteen sections, which, with their presidents, are as follows:—Medicine, Dr. W. T. Brooks; Surgery, Mr. H. P. Symonds; Obstetrics and Gynaecology, Dr. F. H. Champneys; State Medicine, Dr. J. S. Haldane, F.R.S.; Psychological Medicine, Dr. C. A. Mercier; Pathology, Dr. J. Ritchie; Physiology, Prof. Francis Gotch, F.R.S.; Anatomy, Prof. Arthur Thomson; Ophthalmology, Mr. R. W. Doyné; Dermatology, Dr. T. C. Fox; Laryngology and Otology, Mr. C. J. Symonds; Tropical Diseases, Dr. A. Crombie, C.B.; Navy, Army, and Ambulance, Surgeon-General A. Frederick Bradshaw, C.B.; Dental Surgery, Mr. E. A. Bevers.

THE third annual meeting of the general committee of the Cancer Research Fund was held last Friday, July 8, at Marlborough House, the Prince of Wales occupying the chair. The report of the superintendent (Dr. Bashford) details the work that has been carried out during the past year. Specimens of new growths have been examined from a variety of animals, including fish and a wild mouse, showing that cancer occurs in animals in a wild state. Certain cells of malignant new growths have been found to present nuclear changes similar to those by which the sexual cells are prepared for fertilisation, and the fusion of nuclei has been demonstrated in tumours of the mouse. These observations suggest that the new growth of cancer is a mass of cells that has taken on an independent existence. Statistical investigations have also been carried out, and among other things do not support the widely spread belief that cancer is on the increase. The report of the treasurer appeals strongly for more extended pecuniary support; out of a population of 40 millions only 328 individuals and 10 city guilds have contributed, and the income has proved insufficient to meet current expenses.

ON Monday a large deputation waited on Lord Londonderry, President of the Board of Education, to urge the compulsory teaching of hygiene in elementary and secondary schools. The deputation was in support of a petition which has been signed by nearly fifteen thousand medical practitioners. The petitioners urged the central educational authorities of the United Kingdom to consider "whether it would not be possible to include in the curricula of the public elementary schools, and to encourage in the secondary schools, such teaching as may, without developing any tendency to dwell on what is unwholesome, lead all the children to appreciate at their true value healthful bodily conditions as regards cleanliness, pure air, food, drink, &c." The petitioners remark that a widespread ignorance prevails concerning not only the nature and properties of alcohol, but also its effects on the body and the mind. Central education authorities are therefore asked to include in the simple hygienic teaching desired elementary instruction at an early age on the nature and effects of alcohol. Dr. Farquharson, M.P., introduced the deputation, and short speeches in support of its objects were made by Sir W. Broadbent, Dr. D. Griffiths, Sir T. Barlow, Sir Lauder Brunton, Sir Victor Horsley, Dr. Mary Scharlieb, Dr. Hutchinson, and Prof. Sims Woodhead. Lord Londonderry, in reply, said the proposals made by the deputation had his sincerest sympathy, and he only wished it was in the power of the Board of Education to carry them out. He was as anxious as anyone to see increased instruction being given in the laws of health, but at the present time the necessary teachers did not exist, and he should be the last to wish anybody to act as instructor in such important subjects who had not received instruction in them. The Board was at the present moment

devoting itself to the training of teachers and instructing them properly in the whole question of hygiene. He trusted that as time went on its efforts in that direction would bring about the desired results.

IN forwarding to Sir C. Eliot the meteorological returns from fourteen stations in British East Africa, for 1903, Dr. Johnson gives some particulars about the rainfall, and these have been forwarded to us by the secretary of the Meteorological Office. The average amount of rain did not fall in the coast region during the period covered by the report, only 33.84 inches being recorded at Mombasa, 23.24 inches at Malindi, 35.18 inches at Rabai, and Takaungu received 33.72 inches. Shimoni fared better in this respect, as 42.51 inches fell at that station. At up country districts the amount of rain was well up to the average; 80 inches fell at Mumias, 60 at Kisumu, and 51 at Fort Hall. The number of rainy days, *i.e.* days on which at least 0.01 inch of rain fell, varied from 23 at Kismayu to 174 at Eldoma; and at Machakos the number was 93; at Fort Hall, 110; at Nairobi, 111; at Kisumu, 127; and at Mumias, 145. The greatest amount of rain which fell in one day was 5.61 inches at Machakos, on April 28, and the next heaviest rainfall was 4.77 inches at Nairobi, on April 27. The Egyptian Survey Department having asked for returns relating to the lake levels, and also for returns of rainfall from places where the amount of water in the lake would be affected by the amount of rainfall, Dr. Johnson has forwarded instruments to the stations in question, *viz.* :—Nandi, Kericho, and Karungu. A supply of instruments has also been sent to Morendat and to Nairobi, and it is hoped shortly to supplement those already at Fort Hall.

IN *Symons's Meteorological Magazine* for June there is a description of a new pattern rain gauge by Messrs. Lander and Smith, of Canterbury, a firm of chemists which has also recently produced some ingenious self-recording instruments. The chief novelty is that the glass receiver is permanently fixed to the funnel, and by means of a tube the contents can be emptied for measurement into an ordinary measuring glass. The latter is conical below, so that the graduation of small quantities of rainfall may be more accurately measured than is the case in an ordinary glass. A somewhat similar arrangement was proposed by Mr. John Aitken, F.R.S., in the same magazine in 1902, and Dr. Mill then pointed out that in Prof. Hellmann's rain gauges, used at official stations in Germany, the measuring glasses are constructed on the principle suggested by Mr. Aitken, the graduation of the first 10 mm. being fifteen times as long as the others. The "Camden" rain glass recently designed by Messrs. Negretti and Zambra is also conical at the lower end. This arrangement enables the observer to decide, without guessing, whether in cases of very slight rainfall the amount is nearer 0.01 inch than 0.00, and consequently whether the day should be counted as a "rain-day" or whether the precipitation should be disregarded.

A NEW self-recording mercurial barometer has been devised by Mr. W. H. Dines, and is a much improved form of the instrument known as Milne's barograph. Its basis is, therefore, a glass syphon mercurial barometer, having its shorter limb, and a length of the upper portion of its longer limb, of considerably wider calibre than the remainder of the tube. In the shorter limb of the Dines pattern of the instrument, an iron float, of peculiar construction, moves freely, and through the medium of flexible lines connected to the arched heads of a lever-beam (or

differential pulley) multiplication arrangement, this float actuates the recording pen. The clock movement is of Richard's type, and is enclosed within a long but light ebonite cylinder, which it drives, and on the outside of which is wrapped the chart (all the divisions on which are rectangular). The principal feature of Mr. Dines's new pattern of the instrument is a neat temperature-compensating arrangement embraced in the float. The iron float is essentially a cylinder, sealed and weighted at the top, but open underneath, below the level of the mercury in the short limb of the syphon, and when in position the cylinder contains air. It will be evident upon consideration that, given a suitable amount of air within such a float, the effect of the expansion (say) of that air on the occurrence of an increase of temperature will compensate for the alteration in the level of the mercury in the short limb of the syphon resulting from the expansion of the mercury in a syphon barometer having relatively wide upper and lower ends. Mr. Joseph Baxendell informs us that the latest pattern of the new instrument now in use at the Fernley Observatory, Southport, has been rendered practically frictionless, and that the Dines float modifications include a means of overcoming the errors commonly arising from the varying capillary effects occasioned by the reversal of the direction of motion of the mercury in the syphon.

PROF. GEORGE A. GIBSON, writing in the *Proceedings* of the Edinburgh Mathematical Society, vol. xxii., directs attention to a weak point in the conventional treatment of tangents to circles and curves by the method of limits. In proving the tangent to be perpendicular to the radius, it is shown that when a straight line meets a circle in two points A, B, the line makes equal angles with the radii OA and OB, and since this is the case however near B is to A, it is said, "therefore the same result is true when B coincides with A." But, as Prof. Gibson points out, it would be equally logical to say that if OA is the perpendicular from O on a straight line, E any point on that line, OE > OA, however near E may be to A, and "therefore" the same is true when E coincides with A, which is of course absurd. The author remarks, "It is rather disheartening to find the absurdities, so clearly pointed out by Berkeley nearly two hundred years ago, still flourishing and apparently endowed with a new lease of life."

WE have received the new volume of Dr. Otto Baschins's "Bibliotheca Geographica," covering the literature of geography to the end of 1900. The new issue does not contain any important new features, but it completes the first decade of a work recognised for its accuracy and exhaustiveness.

THE Société d'Encouragement pour l'Industrie nationale has published a valuable paper on the Port of Rosario as a supplement to its May *Bulletin*. The author is M. Georges Hersent, and the paper deals fully with the past, present, and future of the seaport. Useful information about the economic geography of the Argentine generally is also to be found in an introductory chapter.

AMONG the most important recent additions to the cartography of Canada are a map of south-eastern Alaska and part of British Columbia, showing the award of the Alaska Boundary Tribunal, and a map of the North-West Territories and the province of Manitoba. The former is reduced from the original Canadian Boundary Commission map to a scale of 1:960,000, and contours at 1000-foot intervals are retained. The map of Manitoba is on a scale of 12½ miles to an inch.

THE June number of the *National Geographic Magazine* contains a speculative article of considerable interest by Mr. R. A. Harris, in which the author discusses the indications of the existence of land in the vicinity of the North Pole, which are afforded by the known set of the currents in the Arctic Ocean and from observations of the tides. It is argued that a tract of land may exist extending from near the north-west corner of Banks Land, or from Prince Patrick Island, to a point north of New Siberia.

THE first place in the June number of *Petermann's Mitteilungen* is given to a short article on the geography of Tibet by Dr. E. Schlagintweit, accompanying an excellent map of central southern Tibet by Herr C. Schmidt. The map, which is on a scale of 1:2,000,000, is compiled from the most recent authoritative data, and the route of the British expedition to Gyantse is shown. Another valuable paper on Tibet is Herr Richard Tronnier's study of the lives and journeyings of the Jesuit Fathers Johannes Grueber and Albert de Dorville, who crossed Tibet in 1661. This appears in the *Zeitschrift* of the Berlin Gesellschaft für Erdkunde.

DR. W. KOERT, of the Prussian Geological Survey, publishes in the *Naturwissenschaftliche Wochenschrift* for May an illustrated article on his observations of marine deposits and coast-erosion in many portions of the world. Among other interesting results of mineral and organic associations, he notes the formation of structureless calcareous concretions in the modern sand of Dar-es-salam, on the coast of German East Africa. These masses he compares with the "kankar" of Indian geologists.

THE fourth number of the *Boletín del Cuerpo de Ingenieros de Minas del Perú* contains an admirably illustrated account of artesian wells established at Callao. A venture started in 1901 was on the eve of being abandoned, when a copious supply of water was struck at a depth of 46 metres. Other wells have since proved equally successful, and Señor Guillet, the author of this memoir, sounds a note of hope for other areas, when he points out that there were no special geological indications to encourage hydraulic enterprise in the subsoils around Lima.

ACCORDING to the report in a local paper of a meeting recently held at Johannesburg, when Mr. W. L. Sclater, of the Cape Town Museum, occupied the chair, a South African Ornithological Union has been established. The new body has a strong and representative committee, with Mr. Sclater as president, and it is hoped that means will be found for publishing a journal.

WE have received from the United States two pamphlets connected with entomology, the one on some results of the work of the entomological division of the Department of Agriculture (*Bulletin* No. 44), and the other notes by Dr. A. S. Packard on the life-history of the silk-producing moths of the family Saturniidae, forming No. 22 of vol. xxxix. of the *Proceedings* of the American Academy. Several articles in the former are devoted respectively to aphides affecting grain and grass, and to chestnut and other nut-feeding weevils.

PROF. HUBRECHT, of Utrecht, has favoured us with a copy of an article by himself from the *Jenaischen Zeitschrift* for 1904, dealing with the origin of annelids and chordates, and the systematic position of the ctenophora and platyhelminthes. Numerous debatable points—especially some connected with the "coelosome"—are discussed in con-

siderable detail, but it must suffice to mention that the author regards ctenophora and platyhelminthes as specialised side-groups, and that in his opinion the foetal envelopes of mammals are directly derived from invertebrate ancestors, and not from those of birds and reptiles.

IN the *American Naturalist* for April, Dr. Shufeldt compares the various schemes of classification of birds which have been proposed during the last quarter of a century or so, and inquires why these are so different. The answer to the latter question is to be found, he thinks, partly in the homogeneous character of birds in general, and partly in the attempts to classify them in the same manner as other and less homogeneous groups. In this respect all classifications are more or less unsatisfactory, and it is no justification to plead that an "order" of birds has not the same systematic value as a division bearing the same name in mammals. Naturalists must make up their minds what characters are of generic and what of higher value, and then formulate a scheme which can be correlated with the classification of other groups. In another article in the same journal Mr. H. B. Bigelow records the results of certain experiments on goldfish which, in his opinion, prove that these fishes are endowed with the power of hearing.

WE have received Messrs. Merck's annual report on advancements in pharmaceutical chemistry and therapeutics. All the newer preparations and drugs receive notice, and the work contains useful bibliographical and authors' indexes and indications for treatment. No medical man or pharmacist who desires to learn the latest additions to the list of drugs can do without this report.

THE action of snake venom on cold-blooded animals has been tested by Dr. Noguchi in a long series of experiments (Carnegie Institution of Washington, *Publication* No. 12). Three venoms were employed, viz. those of the cobra, water moccasin, and rattlesnake. Snakes and frogs succumb easily to cobra venom, but are relatively insusceptible to the other venoms; turtles are more susceptible to all venoms than the foregoing, and fish are still more so. The grasshopper and some crabs are almost insusceptible, while the lobster is only moderately resistant. Excepting the earthworm, all the worms showed a low degree of susceptibility. The venoms have little effect on the Echinodermata; sea-urchins succumbed, however, but starfish and sea-cucumbers were not perceptibly affected.

"SILAJIT," an ancient Eastern medicine, forms the subject of a paper by Mr. David Hooper (*Journ. Asiatic Society of Bengal*, vol. lxxii., part ii., No. 3, 1903). There seem to be three substances known under this name; one appears as an exudation on the rocks in certain districts of the Himalayas, and consists largely of aluminium sulphate; a second, the black and probably true silajit, is said to form an exudation on rocks in Nepal, and consists mainly of alkalies and alkaline earths in combination with an organic acid related to humic acid; and a third, or white silajit, is apparently of animal origin. The substance is said to be a cure for most disorders. Mr. Hooper desires to direct the attention of other observers to this strange product, as it is possible that it has been met with in other parts of the world.

WE have received the "Year Book" of Livingstone College, of which Dr. Harford is the principal. This useful institution is designed to give to missionaries and others whose life-work may lie in the tropics a training in the elements of medicine, surgery, and hygiene such as may

be useful in districts remote from medical aid. Courses of elementary lectures are also given, both at the college and at the United Service Institution, open to all who may expect to reside or travel in the tropics. The "Year Book" contains details of the college and its curriculum, and useful directions for the preservation of health in the tropics.

IN the short notice of Mr. Cecil Hawkins's "Elementary Geometry" in NATURE of June 30 (p. 193), reference was made to the absence of numerical answers in the copy supplied. Mr. Hawkins asks us to state that the book is also supplied with answers if desired.

MESSRS. T. C. AND E. C. JACK, of Edinburgh, have submitted for our inspection four of the plates of a stereoscopic atlas of anatomy, edited by Dr. David Waterston, to be published by them in the autumn. The application of the stereoscopic principle to anatomical illustrations seems, from these examples of it, likely to prove of real assistance to medical and biological students. The plan has already been adopted with success in the teaching of geography and the illustration of books of travel, and there is every likelihood that this further adaptation of the stereoscope to educational work will meet with general approval from lecturers on anatomy. Each stereograph is accompanied by a brief description written by the editor, and the illustration and description are mounted on one card so as to facilitate reference from one to the other. The series will comprise 250 separate stereographs, and these will be contained in cases. The work will be issued at intervals in sections of about fifty stereographs.

OUR ASTRONOMICAL COLUMN.

NEW ELEMENTS AND EPHEMERIS FOR COMET 1904 a.—In No. 55 of the Lick Observatory *Bulletins*, Prof. A. O. Leuschner, of the Berkeley Astronomical Department, gives a set of elements and an ephemeris for comet 1904 a, calculated from observations made by Messrs. Aitken, Crawford, and Madrill on April 17, 22, and 29 respectively.

No. 56 of the same publication contains a second set of elements and an ephemeris calculated by Messrs. Aitken and Madrill from observations made at Lick on April 17, May 8, and May 24. The following are the elements given:—

$$\begin{aligned} T &= 1904 \text{ March } 6^{\text{h}} 9^{\text{m}} 49^{\text{s}} \text{ G.M.T.} \\ \omega &= 53^{\circ} 27' 13'' \cdot 8 \\ \Omega &= 275^{\circ} 46' 5'' \cdot 5 \\ i &= 125^{\circ} 7' 33'' \cdot 1 \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Mean equinox of 1904 } 0$$

$$\log q = 0 \cdot 432475$$

The ephemeris (for oh. G.M.T.) shows that on July 14.5 the comet will occupy the following position in the constellation Canes Ven.:—True $\alpha = 12^{\text{h}} 24^{\text{m}} 28^{\text{s}}$. True $\delta = +50^{\circ} 37' 50''$, and afterwards will travel very slowly in a southerly direction. As the brightness of the comet is now only 0.37 of its original magnitude, only the larger telescopes will be of any use in observing this object.

THE SOLAR PARALLAX AS DETERMINED FROM THE EROS PHOTOGRAPHS.—At the meeting of the Royal Astronomical Society on June 10, Mr. Hinks gave an interesting and instructive account of the Cambridge reduction of all the available photographs of Eros obtained during the period November 7–15, 1900. One of the chief features of the paper was a description of the various errors which appeared during the reduction and of the methods employed for their elimination.

The value obtained for the solar parallax in this preliminary result was $8''.7966 \pm 0''.0047$, and this agrees, within the errors of observation, with that previously obtained by Sir David Gill, whilst the probable error is as small as that obtained by him.

EXPERIMENTS ON THE VISIBILITY OF FINE LINES.—*Bulletin* No. 10 of the Lowell Observatory contains the details and results of a further series of experiments, performed by

Messrs. Slipher and Lampland, on the visibility of fine lines at various distances. The experiments were exactly similar to those previously carried out with a fine wire of 0.7 inch diameter, except that a fine blue line 0.7 inch in width, drawn on a white disc 8 feet in diameter, was observed at the same time as the wire. At a distance of 1450 feet, when the angular width of the disc was $19'$ and that of the lines was $0''.86$, the wire was certainly seen, but a fictitious line was seen accompanying what was supposed to be the real one.

The general results of the experiments indicated that the wire was more generally visible than the line, although at distances less than 400 feet the latter was the more readily seen.

VARIABILITY OF MINOR PLANETS.—Observations of the magnitudes of the minor planets Iris, Ceres, and Pallas, made by Herr J. Holetschek at Vienna during the years 1899 and 1903, are published in No. 3955 of the *Astronomische Nachrichten*. These show that the magnitude of Iris decreased from 7.4 to 7.6 between November 1 and November 6, 1899. Observing Ceres in April, 1899, it was found that the magnitude on April 9d. 14.5h. was 7.5, on April 13d. 11h. 8.1, and on April 14d. 15h. 6.9.

In the case of Pallas the following magnitudes were observed on the various dates named:—

	1903	M.T. (Vienna)	Magnitude
March 23	...	7.6	8.4
24	...	7.6	8.7
24	...	9.8	8.6–8.7
25	...	7.7	8.4–8.5
26	...	7.6	8.5

A VARIABLE STAR CHART.—In No. 3959 of the *Astronomische Nachrichten*, Prof. Max Wolf publishes 25 charts, each showing the relative position of one of the 25 variables in Aquila mentioned in earlier communications published by him in the same journal. An accompanying table gives the chart number and the number, the position, the variation, and the designation of the comparison star for each variable.

THE LEEDS ASTRONOMICAL SOCIETY.—No. 11 of the annual *Journal and Transactions* of the Leeds Astronomical Society contains reprints of seven very interesting lectures, on a variety of astronomical subjects, delivered at the society's meetings during last year. A number of letters on current astronomical questions, contributed to various periodicals by the past president, Mr. C. T. Whitnell, are also reproduced. The frontispiece shows a number of photographic reproductions of ancient coins on which were depicted various astronomical symbols, and illustrates a lecture on that subject delivered by Mr. A. Dodgson. The programme of the meetings for 1904 promises some very interesting papers, whilst the report for 1903 shows the society to be in a thriving condition.

"ANNUARIO" OF THE RIO DE JANEIRO OBSERVATORY (1904).—The twentieth annual publication of the Rio de Janeiro Observatory contains a large amount of useful information on astronomical, meteorological, and general physical matters. The customary calendars and astronomical tables are given in part i. Parts ii., iii., and iv. contain tables of reduction for astronomical and meteorological observations. The usual tables for the conversion of foreign standards are given in part v., whilst the sixth and last section contains many useful records of the local meteorological and magnetic conditions for past years, including the variation of magnetic declination at Rio de Janeiro since 1660.

GEOLOGICAL SURVEYS OF THE UNITED STATES.

SINCE the appearance of the notice in NATURE of December 3, 1903, the following publications of the United States Geological Survey have been received.

I. *Bulletins*.

Of very wide interest is the essay on "The Correlation of Geological Faunas: a Contribution to Devonian Palaeontology," by Prof. H. Shaler Williams (*Bulletin* No. 210). The observations are based on a critical examination of the